

HARLEQUIN DUCK (*Histrionicus histrionicus*)

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Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
20	15	10	10	0	10	10

Special Concern Priority

Currently considered a Bird Species of Special Concern, Priority 1. Included on the original prioritized list, Priority 3, (Remsen 1978), and on CDFG's (1992) unprioritized list. Formerly candidate (category 2) for federal listing as either Threatened or Endangered by USFWS (56 Federal Register [225]: 58811).

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2000).

General Range and Abundance

No subspecies currently recognized (American Ornithologists Union 1957, Robertson and Goudie 1999). Two subspecies, including Pacific (*H. h. pacificus*) and Atlantic (*H. h. histrionicus*), were formerly recognized but morphological evidence did not support this distinction (Palmer 1976, Robertson and Goudie 1999).

In western North America, breeds in western Alaska, northern Yukon, northern British Columbia (including offshore islands), southern Alberta, interior Washington, eastern Oregon, central Idaho, western Wyoming, and, at least formerly, in southwestern Colorado and the western Sierra Nevada, California. In eastern North America, breeds from southern Baffin Island south to central Quebec, eastern Labrador, and possibly Newfoundland. Also breeds in Greenland, Iceland, eastern Siberia and northern Mongolia (American Ornithologists Union 1998, Robertson and Goudie 1999). In western North America, winters in coastal waters from the Aleutian Islands, through coastal Alaska and British Columbia south to coastal Washington, especially in Puget

Sound and Juan de Fuca Strait; uncommon in winter on Oregon and California coasts, and extremely rare records south to the Gulf of California (Robertson and Goudie 1999).

Seasonal Status in California

Partially resident in California, the Harlequin Duck occupies two distinct geographical areas within the state: the coast in winter (October through April), and the western slope of the Sierra Nevada for breeding (at least historically). Rare, nonbreeding individuals can remain in coastal areas through the summer (Grinnell et al. 1918). Harlequin Ducks currently wintering along the California coast are primarily from northern breeding populations, but a portion of the historical wintering population nested in the Sierra Nevada (Grinnell et al. 1918, Brown 1998).

Historical Range and Abundance in California

Harlequin Ducks were historically uncommon in both their winter and breeding ranges in California (Grinnell et al. 1918, Grinnell and Miller 1944).

Wintering. Wintering populations were documented at Humboldt Bay, Humboldt County; Bodega Bay, Sonoma County; Pt. Reyes, Tomales Bay, Tomales Point, Marin County; San Francisco Bay, Point Pinos and Point Carmel, Monterey County; Piedras Blancas, San Luis Obispo County; and coastal Santa Barbara County (Grinnell et al. 1918). Harlequin Ducks were not documented historically anywhere in interior California between the coast and Sierra Nevada, although at least some individuals must have passed back and forth between their wintering and breeding grounds (Grinnell and Miller 1944).

Breeding. Harlequin Ducks were found nesting historically along secluded portions of the Stanislaus and Tuolumne Rivers and their tributaries, where young broods were found from “about 4,000 feet upward,” and “many” were seen; hens and their broods were often found hiding in streamside growths of *Saxifrage* (Belding 1891, Beldling [MS] in Grinnell et al. 1918). Other documented historical nesting localities in the central Sierra Nevada included: Griswold Creek, tributary to the Stanislaus River, Tuolumne County, South Fork of the Tuolumne River, Tuolumne

County; Cherry River in upper Tuolumne basin, Tuolumne County; South Fork Merced River, Mariposa County; Lake Ediza (9,300 ft) in the headwaters of the San Joaquin River, Madera County (Grinnell et al. 1918, Grinnell and Miller 1944); and the Merced River in Yosemite Valley, Merced County (Michael and Michael 1922, Grinnell and Storer 1924).

Recent Range and Abundance in California

Despite the irregular, but continued, presence of Harlequin Ducks in California's coastal waters, they are extremely rare or absent from their historical breeding range in the Sierra Nevada.

Wintering. Harlequin Ducks along the coast have declined from historic levels and are now uncommon or rare in most areas (Robertson and Goudie 1999). In recent years, they have been seen regularly as far south as San Luis Obispo County (Small 1994), and a few records exist for the coast of northern Baja California in the Gulf of California (Howell and Webb 1995). Most recent winter records are from Monterey Bay, Pt. Reyes, Tomales Bay, and Bodega Bay; the largest wintering populations are off Point St. George, Del Norte County, where they were seen historically in the tens or hundreds (Brown 1998). Extremely rare individuals have been observed in fall and winter at interior, freshwater lakes in Butte, Glenn, Sacramento, and Ventura Counties, and they have been recorded at San Miguel Island (Small 1994) and the Farallon Islands (DeSante and Ainley 1980).

Breeding. Apparently extirpated from their historical breeding range in central Sierra Nevada, nesting Harlequin Ducks have not been documented along any rivers of the Yosemite region since the mid-1920s (Gaines 1992). The only recent Sierra Nevada breeding records were flightless young observed 1.5 miles above Salt Springs Reservoir on the Mokelumne River in Calaveras and Amador Counties in 1971, 1972, and 1976 (Remsen 1978, McCaskie et al. 1979); and a female with five young observed at Thermalito Forebay, near Oroville, Butte County (Laymon pers. comm.).

Recent observations of apparently nonbreeding individuals in the western Sierra Nevada and Cascade Range were summarized by Williams (pers. comm.): 1 female above Salt Springs Reservoir in 1968 (Leach pers. comm.); 1 male on Tenaya Creek below Snow Creek, Merced County, in 1972, and a pair on the South Fork Merced River near Wawona, Mariposa County, in 1978 (Gaines 1992); 2 females at Upper Twin Lake, Lassen National Park, Lassen County, in 1978 (Laymon pers. comm.); 4-5 individuals “in female plumage” on the North Fork Mokelumne River, Alpine County, at about 4,720 feet in 1979 (Blumenthal pers. comm.); Wawona Campground, South Fork Merced River, Mariposa County, in 1981 (Frazer and Zahm pers. comms.); North Fork American River, Placer County, from 4,600 to 5,500 feet in 1993 (1 female), 1994 (2 females), and 1998 (1 female) (Beedy pers. obs.); a pair at Yreka’s Greenhorn Park, Siskiyou County, in 1996 (Ekstrom pers. comm.); a pair on the Silver Fork of the South Fork American River near Kyburz, El Dorado County, at about 4,000 feet in 1997 (Cooley pers. comm.); 1 male on the North Fork Feather River 3 miles below Belden Inn, Plumas County, in 1999 (Dimick pers. comm.); unconfirmed records from the Rubicon River (Placer County) also exist from the mid-1990s (Morris and Williams pers. comms.).

Ecological Requirements

Wintering Harlequin Ducks occur in shallow, intertidal and subtidal coastal waters. They forage near large kelp beds, over rocky shorelines, breakwater areas, submerged cobble benches, and coastal lagoons, often in rough water (Small 1994, Robertson and Goudie 1999). Harlequin Ducks usually forage in shallow water along rocky shorelines, but they can dive to depths up to 20 m. Their diet is composed entirely of animal matter including a variety of intertidal and subtidal marine invertebrates such as crustaceans, amphipods, and gastropods (especially mussels), and occasionally small fish and roe (Palmer 1976, Robertson and Goudie 1999). Pair formation begins in October and more than half the females are paired by December (Robertson et al. 1998).

Throughout their range, nesting Harlequin Ducks are found along turbulent mountain rivers. They prefer streams with low acidity, steep banks, instream rocks and islands for roosting and nesting, and relatively high vegetative cover on streambanks. Nest initiation occurs from early May to early June, and they are single-brooded. They forage by diving in clear, cold rapids where they search rock crevices for aquatic insects including the adults and larvae of caddisflies, mayflies, and stoneflies; occasionally they consume small fish (Robertson and Goudie 1999).

Although no nests have been described in California, they were thought to nest historically “among the rocks” (Belding [MS] *in* Grinnell et al. 1918). Elsewhere in their range, Harlequin Ducks usually nest on the ground, under the shelter of driftwood or rocks, and always beside swift-flowing rivers. They sometimes nest on cliff ledges, and in cavities in trees and stumps lined with conifer needles, mosses, or leaf litter. Clutch sizes ranged from 5 – 7 eggs in Alberta and Oregon, and the young hatch in about 28 days. Females brood the precocial young alone, when they often move to slower stretches of their nesting streams (Robertson and Goudie 1999).

Threats

The cause of the Harlequin Duck’s virtual disappearance from its historical nesting range in the Sierra Nevada is unknown, but Belding (1891) remarked that they were becoming rare in their former haunts along the Stanislaus River due to “...destruction by fishermen, who shoot the birds on sight.” They are considered an uncommon species throughout their range, especially for a duck, and such an extermination program could easily remove their sparse breeding populations from popular fishing streams (Brown 1998).

Shooting and trapping are key factors in the reduction and loss of North American breeding populations (Robertson and Goudie 1999). Ingestion of pesticides, plastics, lead and other toxicants are risks for wintering populations, and oil spills are also known to adversely affect this species in coastal areas (Robertson and Goudie 1999). In the Sierra Nevada, degradation of former breeding streams by hydraulic mining, logging and dams have removed extensive areas of suitable nesting

habitat. Chronic disturbance of nesting populations by rafters, hikers, fishermen, and researchers can reduce reproductive success (Robertson and Goudie 1999). Heavy recreational use of most large rivers on the west slope of the Sierra Nevada may preclude their recolonization of otherwise suitable habitat areas. Studies of Harlequin Ducks in other areas suggest that they are very traditional in their choice of breeding and wintering areas, and once they have been extirpated from a watershed, recolonization may be a slow and uncertain process (Brown 1998).

Management and Research Recommendations

Despite their status as one of the state's rarest nesting birds, no accurate population estimates are available for either their wintering or possible breeding populations in California. Similarly, it is unknown whether the few individuals that have been observed in the Sierra Nevada since the 1970s were colonists from northern breeding populations, or whether they wintered along California's coast.

Rare and localized species such as Harlequin Ducks are unlikely to be detected during most standardized bird censuses (e.g., Breeding Bird Surveys, waterfowl counts by California Department of Fish and Game and U.S. Fish and Wildlife Service), and most of their potential habitat areas are not surveyed effectively by birders (Remsen 1978). Therefore, more systematic surveys of remote stream reaches in the Yosemite region, northern Sierra Nevada, and Cascade Range will be required to determine if nesting populations continue to exist in California. If extant populations are found during such surveys, measures should be taken to avoid human disturbance of possible nesting pairs during the breeding season from early May through mid-July. Steamside hiking and rafting are prohibited in many eastern Canadian and U.S. national parks in high density Harlequin Duck nesting areas (Robertson and Goudie 1999).

Monitoring Needs

Since no population data currently exist for nesting Harlequin Ducks in California, any observations of this species in interior California are important and should be well documented with notes and

photographs, if possible. Systematic surveys of rivers with historical or recent observations should be performed at least once every five years (or preferably more often) to document possible nesting populations that may exist in the Sierra Nevada or Cascade Range.

Acknowledgments

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